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ELECTROTECHNICAL VOCABULARY

PART XLVI RESISTORS

(First Reprint JUNE 1991)

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Indian Standard
ELECTROTECHNICAL VOCABULARY
PART XLVI RESISTORS

0. FOREWORD

0.1 This Indian Standard (Part XLVI) was adopted by the Indian Standards Institution on 19 September 1977, after the draft finalized by the Basic Standards on Electronics and Telecommunication Sectional Committee in consultation with the Resistors Sectional Committee had been approved by the Electronics and Telecommunication Division Council.

0.2 With progressive formulation of Indian Standards on many types of resistors used in electronic equipment, the need for uniform definitions of terms relating to these types of components was felt. With a view to ensuring this and avoiding repetition of these terms and definitions in individual standards, this standard has been prepared.

0.3 This standard is one of a series of Indian Standards on electrotechnical vocabulary. A list of standards so far published in this series, related to electronics and telecommunication is given on page 20.

0.4 While preparing this standard attempt has been made to follow, as far as possible, the definitions proposed by the International Electrotechnical Commission in their document No. 40 (IEV 516) (Secretariat) 322 'Draft definitions for the inclusion in IEC Publication 50 : International Electrotechnical Vocabulary. Chapter 516 : Capacitors and resistors for electronic equipment'.

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1. SCOPE

1.1 This standard (Part XLVI) covers terms and definitions relating to resistors, fixed, variable and non-linear.

2. GENERAL

2.1 Admittance — The current flowing in a circuit divided by the terminal voltage. It is the reciprocal of the impedance.

2.2 Complex Admittance — A complex quantity having the scaler value of the admittance as its modulus and the phase displacement between voltage and current as argument. The argument is positive when the current leads the voltage.

2.3 Inductive Reactance -- The product of the inductance and the angular frequency.

2.4 Capacitive Reactance — The reciprocal (with negative sign) of the product of the capacitance and the angular frequency.

2.5 Effective Reactance — The component of the voltage in quadrature with the current, divided by the current.

2.6 Impedance — The terminal voltage of a circuit divided by the current following through it.

2.7 Complex Impedance — A complex quantity having the scaler value of the impedance as its modulus and the phase displacement between current and voltage as its argument. The argument is positive when the voltage leads the current.

2.8 Conductance — The component of current in phase with the terminal voltage of a circuit, divided by that voltage.

2.9 Susceptance — The component of admittance which is due to capacitance.

NOTE — The definitions given under **2.1** to **2.9** shall be applied only to sinusoidal current.

2.10 Category Dissipation — The maximum allowable dissipation under continuous load at an ambient temperature equal to the upper category temperature and is normally expressed as a percentage of the rated dissipation.

2.11 Dissipation Factor — The ratio of resistance to reactance.

It is the reciprocal of the Q-factor and may be expressed as a percentage.

2.12 Maximum Dissipation — The dissipation which can be applied to a resistor for an extended period of time in still air at a defined temperature.

2.13 Rated Dissipation — The maximum allowable dissipation at a specified ambient temperature under the conditions of the electrical endurance test at the same temperature and which will result in a change in parameters not greater than those specified for this endurance test.

2.14 Duty Cycle — The ratio of the time during which a device operated during one cycle and the duration of that cycle.

2.15 Rated Duty Cycle — The duty cycle for which the resistor is designed.

2.16 Ambient Temperature — The temperature of atmosphere in the immediate vicinity of the resistor where the resistor is not dissipating power.

2.17 Category Temperature Range — The range of ambient temperatures at which a resistor may be operated continuously. It is indicated by the lowest and highest temperature of the range.

2.18 Lower Category Temperature — The minimum ambient temperature for which the resistor has been designed to operate continuously.

2.19 Upper Category Temperature — The maximum ambient temperature for which the resistor has been designed to operate continuously, at that portion of the rated dissipation which is indicated in the category dissipation.

2.20 Maximum Surface Temperature — The temperature at the hottest point of the external surface, including the terminations.

2.21 Minimum Surface Temperature — The temperature at the coldest point of the external surface including the terminations.

2.22 Zero Wattage Temperature — The maximum permissible surface temperature a resistor can withstand without load and without causing harm to the resistor.

2.23 Rated Temperature — The maximum ambient temperature at which a resistor may be operated continuously with the rated/power voltage applied.

2.24 Temperature Dependence of Resistance — The temperature dependence of resistance shall be expressed either as temperature characteristic or as temperature coefficient as defined below.

2.24.1 *Temperature Characteristic of Resistance* — The temperature characteristic of resistance of a resistor is the change in resistance, expressed as percentage, between a reference temperature and another temperature normally the upper of lower category temperatures.

$$\text{Temperature characteristic of resistance} = \frac{100 \, \Delta R}{R}$$

where

$\frac{\Delta R}{R}$ is the change in resistance between the two specified ambient temperatures, and

R is the resistance value at the reference temperature.

2.24.2 *Temperature Coefficient of Resistance* — The temperature coefficient of resistance of a resistor is the mean rate of change of resistance occurring between two specified ambient temperatures. It may be expressed either as a percentage, or as parts per million, per degree Celsius.

Temperature coefficient (percent/°C) =

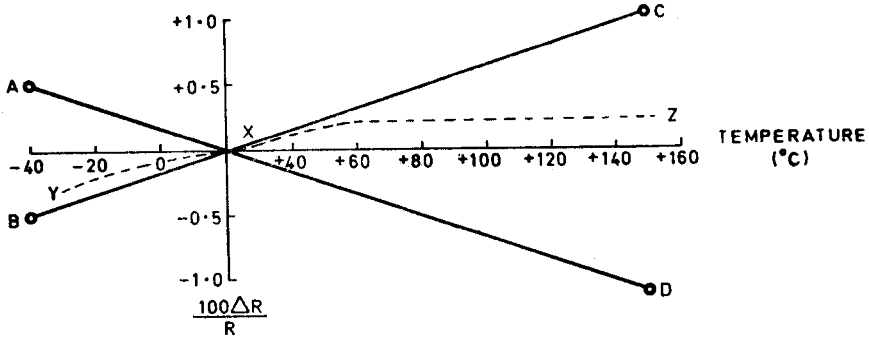
$$\frac{\text{Temperature characteristic of resistance}}{\Delta T} = \frac{100 \, \Delta R}{R . \Delta T}$$

Temperature coefficient (ppm/°C) =

$$\frac{10\,000 \times \text{Temperature characteristic of resistance}}{\Delta T} = \frac{10^6 \, \Delta R}{R . \Delta T}$$

where ΔT is the algebraic difference, in degrees Celsius, between the reference temperature and the other specified ambient temperature.

Note — It must be noted that use of the term temperature coefficient does not imply any degree of linearity for this function, nor should any be assumed (*see* Fig. 1).



A, *B*, *C* and *D* are the test limits for temperature characteristic of resistance at the upper and lower category temperatures.

AX and *BX* represent the assumed limits of percentage change in resistance between +20°C and lower category temperature.

CX and *DX* represent the assumed limits of percentage change in resistance between +20°C and upper category temperature.

YZ represents the actual percentage change in resistance of a resistor having a non-linear temperature coefficient.

Fig. 1 Diagram Indicating : (a) Test Limits for Temperature Characteristic of Resistance at Upper and Lower Category Temperatures, (b) Assumed Limits Between Upper and Lower Category Temperatures, and (c) An Example of the Change in Resistance of a Resistor Having a Non-linear Temperature Coefficient

2.25 Isolation Voltage (Applicable Only to Insulated Resistors) — The maximum dc or peak ac voltage under continuous operating conditions which may be applied between the resistor terminations and any conducting mounting surface.

The isolation voltage shall never be less than the peak voltage that could be applied to the element; it shall therefore, be not less than 1·42 times the limiting element voltage.

2.26 Rated Voltage — The dc or ac rms voltage calculated from the square root of the product of the rated resistance and the rated dissipation.

2.27 Self Capacitance — The capacitance of a resistor which is not essentially used for its capacitance, normally expressed as an equivalent parallel connected capacitance.

2.28 Self Inductance — The magnetic flux linked by a closed circuit divided by the current flowing through that circuit.

3. FIXED RESISTORS

3.1 Resistance (Property) — That property of substance which restricts the flow of electric current through it, associated with conversion of electrical energy into heat.

3.2 Resistance (Quantity) — The magnitude of this restriction.

3.3 Resistance (of an Ideal Resistor) — The quotient of the voltage by the current.

3.4 Resistor — An element the principal property of which is resistance.

3.5 Ideal Resistor — An ideal 2-terminal circuit element for which the instantaneous voltage is proportional to the instantaneous current.

3.6 Rated Resistance — The nominal resistance value taking into account the tolerance marked on the resistor.

3.7 Critical Resistance — The critical resistance is that resistance value at which the rated voltage is equal to the limiting element voltage. Below the critical resistance the maximum voltage which may be applied across the terminations of a resistor is the rated voltage. Above that value the maximum voltage is the limiting element voltage.

3.8 Limiting Element Voltage — The limiting element voltage is the maximum dc or ac rms voltage that may be applied to the terminations of a resistor, if its value is equal to or greater than the critical resistance value.

3.9 Current-Noise Index — The current-noise index 'microvolts per volt in a decade' expressed in dB is the term used to express the 'noisiness' of individual resistors.

The ideal rectangular pass band associated with the current-noise is one frequency decade, geometrically centered at 1 000 Hz.

The index is defined as follows:

$$\text{Current-noise index} - 20 \log_{10} \frac{V_{\mathrm{rms}}}{V_{\mathrm{T}}} \text{ dB (in a frequency decade)}$$

Where V_{rms} is the number of microvolts of open circuit rms current-noise voltage in a frequency decade and V_{T} is the number of dc volts applied to the resistor under test.

Since the current-noise power spectrum approximates to a $1/f$ frequency characteristic, the index provides an estimate of current-noise, in any frequency decade.

3.10 Current-Noise Voltage — The current-noise resulting from the presence of direct current in a fixed resistor causes an increase in mean-square voltage over that due to thermal-noise. The current-voltage noise is the difference between the rms value of the total noise voltage and that of the thermal-noise voltage.

A resistor exhibiting current-noise may be represented as a noise source having a zero-impedance current-noise voltage generator connected in series with an independent (that is a non-coherent) thermal-noise voltage generator and with a noise-free resistor.

The mean-square value of current-noise voltage per unit pass band varies substantially inversely with frequency. If the mean-square voltage is inversely proportional to frequency, then ideal rectangular pass bands having equal ratios of upper to lower band-pass limits transmit equal amounts of noise voltage from a given noise source.

3.11 Thermal-Noise Voltage — The fluctuation voltage caused by the random motion of thermally agitated charges. It is present in all resistors. It is not necessary to determine the magnitude of thermal-noise by actual measurement since the mean-square value of the fluctuating voltage appearing at the open-circuit terminals of a resistor, which would be indicated by the measuring system, may be calculated using Nyquist's equation :

$$Vn^2 = 4\,k\,T\,R\,\triangle f$$

where

k = Boltzmann's constant: $1{\cdot}38 \times 10^{-23}$ watt seconds per degree Kelvin,

T = the absolute temperature in degree Kelvin,

R = the resistance value in ohms,

$\triangle f$ = the effective pass band of the measuring system in Hertz, and

Vn = thermal-noise voltage.

4. VARIABLE RESISTORS

NOTE — The term and definitions given in this clause relate to widely used rotary variable resistors with a control spindle. For other types of variable resistors, such as, slides type, the term 'travel' is used for 'rotation'.

4.1 Variable Resistor — A resistor which can be varied by mechanical means.

4.2 Variable Resistor (Precision) — A mechanically variable resistor of a type suitable for application in circuits where high stability of the resistance value, an exactly defined resistance law and close tolerance are essential. The dissipation is generally not of major importance.

4.3 Variable Resistor (General Purpose) — A mechanically variable resistor of a type suitable for application in circuits where stability of the resistance value, tolerance on resistance law and tolerance on resistance value are generally not of major importance. In certain types, power dissipation facilities may be essential.

4.4 Variable Resistor (Preset) — Variable resistors of precision or general purpose type which are designed for relatively infrequent adjustments.

NOTE — Typical examples of present variable resistors are single turn rotary variable resistors with screw-driver slot, lead screw actuated devices, etc.

4.5 Container Sealed Variable Resistor — A variable resistor in which the spindle bearing and the container housing of the variable resistor itself are gas-tight.

4.6 Variable Resistor with a Panel Seal, a Spindle Seal or Both — Panel sealed and/or spindle sealed variable resistor are those in which a spindle seal and/or a panel seal are provided to prevent particles and fluid from entering any equipment in which they are mounted.

4.7 Resistance Law — The relationship of the effective resistance value between terminations *a* and *b* or of the output ratio $\frac{V_{ab}}{V_{ac}}$ to the mechanical position of the moving contact.

NOTE — The resistance law is generally of linear, log, reverse log, sine and cosine type.

4.8 Effective Resistance — That portion of the total resistance over which the resistance changes in the manner prescribed by the declared resistance law.

4.9 Minimum Effective Resistance — The resistance value at each end of the effective rotation between termination *b* and the nearest end termination *a* or *c*.

4.10 Terminal Resistance — The minimum resistance which can be obtained between the end termination *a* or *c* and the termination of the moving contact *b*. Where there is not sharp change of resistance between the end stop and the point where the minimum effective resistance is observed, the terminal resistance and the minimum effective resistance become the same. The lowest resistance value need not correspond with the mechanical end stops.

4.11 Rotation (Direction of) — Rotation is defined as clockwise or anti-clockwise when viewing the face of the variable resistor which includes the means of actuation.

4.12 Angle of Effective Rotation — Angle throughout which the resistance changes in the manner prescribed by the declared resistance law.

4.13 Angle of Ineffective Rotation — The angle over which the declared resistance law is not applicable.

4.14 Total Mechanical Rotation — The full extent of the travel of the actuating device between the end stops. In variable resistors fitted with a slipping clutch, the end stops are defined as those points where the clutch starts to slip at each end of the travel of the moving contact.

4.15 Rotational Noise (for Wire-Wound Variable Resistors) — Any spurious variation in the electrical output not present in the input, defined quantitatively in terms of an equivalent parasitic, transient resistance in ohms, appearing between the contact and the resistance element when the shaft is rotated or translated.

4.16 Limiting Slider Current — The maximum current that may be passed between the resistance element and the moving contact.

4.17 Effective Operating Turns — The number of effective operation turns is the minimum number of turns of the actuating device that is required to change the output voltage from minimum to maximum.

4.18 Linearity — The specific type of conformity where the theoretical law or voltage ratio is a straight line.

4.19 Absolute Linearity — The maximum deviation expressed as a percentage of the total applied voltage, of the actual law from a straight reference line drawn through the specified minimum and maximum output ratios, which are separated by the theoretical angle of effective rotation.

4.20 Independent Linearity — The maximum deviation, expressed as a percentage of the total applied voltage, of the actual law from a straight reference line with its slope and position chosen to minimise deviations over the effective angle of rotation, or any specified portion thereof.

4.21 Terminal Based Linearity — The maximum deviation, expressed as percentage of the total applied voltage, of the actual law from a straight reference line drawn through the specified minimum and maximum output ratios which are separated by the angle of effective rotation.

4.22 Zero Based Linearity — The maximum deviation, expressed as a percentage of the total applied voltage, of the actual law from a straight reference line drawn through the specified minimum output ratio extended over the angle of effective rotation, with its slope chosen to minimise the maximum deviations.

4.23 Output Smoothness (for Non-wire Wound Types Only) — Any spurious variation in the electrical output not present in the input, defined quantitatively in terms of an equivalent parasitic, transient resistance in ohms, appearing between the contact and the resistance element when the shaft is rotated or translated. The equivalent noise resistance is defined independently of the resolution, the functional characteristics, and the total travel. The magnitude of the equivalent noise resistance is the maximum departure from a specified reference line. The wiper of the variable resistor is required to be excited by a specified current and moved at a specified speed.

4.24 Phasing — The relative alignment of the phasing points of each section of a gang variable resistor.

4.25 Phasing Point — The point of reference on each section to describe the relative alignment of the sections of a gang with respect to the position of the moving contacts.

4.26 Conformity — The degree of conformity is the maximum deviation of the actual from the theoretical resistance when these are expressed as percentages of the effective resistance.

4.27 Absolute Conformity — The maximum deviation expressed as a percentage of the total applied voltage, of the actual law from the theoretical law passing through the specified minimum and maximum output ratios which are separated by the theoretical angle of effective rotation.

4.28 Tap — A tap is a fixed electrical connection made to the resistance element.

4.29 Tap Location — The tap location is the position of a tap relative to some reference.

4.30 Effective Tap Width — The travel of the spindle, during which the voltages at the moving contact termination *b* and the tap connection are essentially the same as the moving contact is moved past the tap in one direction.

4.31 Resolution (Theoretical) (for Wire-Wound Variable Resistors Only) — The reciprocal of the number of turns of the resistance winding in the actual electrical travel and is expressed as a percentage.

4.32 Resolution (for Wire-Wound Variable Resistors Only) — A measure of the sensitivity to which the output ratio or percentage of total resistance of the variable resistor may be set.

4.33 Lateral Run Out — The perpendicularity of the mounting surface with respect to the rotational axis of the spindle and measured on the mounting surface at a specified distance from the outside edge of the mounting surface when the spindle is held and the body of the variable resistor is rotated while specified loads are applied radially and axially to the body of the resistor.

4.34 Spindle Run Out — The eccentricity of the spindle diameter with respect to the rotational axis of the spindle and measured at a specified distance from the end of the spindle when the body of the variable resistor is held and the spindle rotated while a specified load is applied radially to the spindle.

4.35 Pilot Surface Run Out — The eccentricity of the pilot diameter with respect to the rotational axis of the spindle, expressed in millimetres, and measured on the pilot diameter when the spindle is held and the body of the variable resistor is rotated while a specified load is applied radially to the body of the resistor.

4.36 Spindle End Play — The total axial excursion of the spindle, expressed in millimetre and measured at the end of the spindle with a specified axial load applied alternatively in opposite directions.

4.37 Spindle Side Play — The total radial excursion of the spindle, expressed in millimetre and measured at a specified distance from the pilot surface of the unit, with a specified radial load applied alternatively in opposite directions at a specified point.

4.38 Operating (Starting) Torque — The maximum moment in the clockwise and anti-clockwise direction required to initiate spindle rotation anywhere in the total mechanical rotation region.

4.39 Running Torque — The maximum moment in the clockwise and anti-clockwise direction required to sustain uniform spindle rotation at a specified speed throughout the total mechanical rotation region.

4.40 Mechanical Backlash — The maximum difference in the spindle position that occurs when the spindle is moved to the same actual output ratio point from opposite directions. This measurement excludes the effects of resolution and contact width.

4.41 Pilot Diameter — Diameter of the circular hub of the rim concentric with the shaft of the variable resistor and which helps in accurate positioning of the variable resistor in the panel mounting hole.

4.42 End-Stop Torque — The maximum static torque which can be applied without causing any damage to the spindle or actuating mechanism with the contact set against the stop.

4.43 Switch Torque — The torque necessary to operate the switch.

4.44 Locking Torque — The maximum torque that can be applied to the spindle without slip.

4.45 Clutch Action — That action which allows continuous rotation of the actuating device after the moving contact has reached either end of the resistance element.

5. NON-LINEAR RESISTORS

5.1 Dissipation Factor of the Thermally Sensitive Element — The ratio of the change in power dissipation in the thermally sensitive element, to the resultant change of temperature of the heater element, with zero-power dissipation of the heater element. This ratio is expressed in milliwatts per degree Celsius.

5.2 Dissipation Factor of the Heater Element (for Indirectly Heated Thermistors Only) — The ratio of the change in power dissipation in the heater element, to the resultant change of temperature of the heater element, with zero-power dissipation of the thermally sensitive element. This ratio is expressed in milliwatts per degree Celsius.

5.3 Maximum Dissipation of the Thermally Sensitive Element (for Indirectly Heated Thermistors Only) — The maximum dissipation which can be applied to the thermally sensitive element for an extended period of time in still air at 27°C and with zero-power dissipation of the heater element.

5.4 Maximum Dissipation of the Heater Element (for Indirectly Heated Thermistors Only) — The maximum dissipation which can be applied to the heater element for an extended period of time in still air at 27°C and with zero-power dissipation of the thermally sensitive element.

5.5 Minimum Resistance (of PTC Thermistor) — The zero-power resistance of the thermistor at a temperature which is the lower limit of the PTC part.

5.6 Switching Resistance (of PTC Thermistor) — The value of zero-power resistance which is twice the minimum resistance.

5.7 Rated Zero-Power Resistance Value of the Thermally Sensitive Element (for Indirectly Heated Thermistors) — The nominal value of resistance of the thermally sensitive element at zero-power, at a specified standard reference temperature and at zero-power dissipation of the heater element.

5.8 Rated Zero-Power Resistance Value of the Heater Element (for Indirectly Heated Thermistors) — The nominal value of resistance of the heater element at zero-power, at a specified standard reference temperature and at zero-power dissipation of the thermally sensitive element.

5.9 Resistance/Temperature Characteristic — The relationship between the zero-power resistance of the thermally sensitive element and the temperature.

5.10 Zero-Power Resistance (R_T) — The value of resistance of a thermistor when measured:

a) at a specified temperature, under conditions such that the change in resistance due to the internal generation of heat is negligible with respect to the total error of measurement ; and

b) with a specified voltage.

5.11 Rated Zero-Power Resistance (for Directly Heated Thermistors) — The value which is indicated on the thermistor. This is the nominal value at the standard reference temperature of 27°C, unless otherwise specified.

5.12 Switching Temperature — The temperature higher than temperature T_{Rmin} (or θ min) (*see* **2.18**), at which switching resistance is reached.

5.13 Temperature Coefficient of Resistance at Zero-Power (for Directly Heated Thermistors) — The ratio, at a specified temperature, of the relative variation of the zero-power resistance of the thermistor to the temperature variation.

5.14 Temperature Coefficient of the Thermally Sensitive Element (αth) (for Indirectly Heated Thermistors) — The ratio, at a specified temperature T, of the relative variation of the zero-power resistance of the thermally sensitive element to the temperature change which produces this variation, without dissipation of the heater element.

$$\alpha\text{th} = \frac{100}{dT}\,\frac{d R_{th}}{R_{th}} = -\,\frac{100\,B}{T^2} \text{ (in percent per degree C)}$$

where

B = the index of the thermal sensitivity in degree Kelvin, and
T = the temperature in degree Kelvin.

5.15 Temperature Coefficient of the Heater Element (αth) (for Indirectly Heated Thermistors) — The ratio, at a specified temperature T, of the relative variation of the zero-power resistance of the heater element to the temperature change which produces this variation, without dissipation of the thermally sensitive element.

$$\alpha\text{ch} = \frac{100}{dT}\,\frac{dR_{ch}}{R_{ch}} \text{ (in percent per degree C)}$$

5.16 Index of Thermal Sensitivity (B-Value) — An index of temperature sensitivity, expressed in the formula :

$$B = \frac{T_1 \cdot T_2}{T_2 - T_1} \cdot \log_e \frac{R_1}{R_2}$$

or

$$B = 2{\cdot}303\,\frac{T_1 \cdot T_2}{T_2 - T_1} \log_{10} \frac{R_1}{R_2}$$

where

B = a constant,
R_1 = resistance in ohms at temperature T_1 in degree Kelvin, and
R_2 = resistance in ohms at temperature T_2 in degree Kelvin.

5.17 Thermal Time Constant of the Thermally Sensitive Element — The time necessary for the thermally sensitive element to vary its temperature by 63·2 percent of the total difference between its initial temperature and its final temperature when it is subjected to a temperature step under zero-power condition at a constant ambient temperature.

5.18 Thermal Time Constant Due to the Heater Element (αth_2) (for Indirectly Heated Thermistors) — The temperature change caused by the sudden application of the maximum power dissipation *P*ch to the heater element, with zero-power dissipation of the thermally sensitive element.

5.19 Intrinsical Thermal Time Constant (αth_1) — The temperature change caused by the passage of a current through the thermally sensitive element, with zero-power dissipation of the heater element. The time constant is expressed in seconds.

5.20 Thermistor — A thermally sensitive semiconductor resistor whose primary function is to exhibit a significant change in electrical resistance with a change in body temperature.

5.21 Negative Temperature Coefficient Thermistor (NTC) — A thermistor in which the zero-power resistance decreases with increasing temperature. Directly heated NTC thermistors obtain their temperature variation by the passage of a current through the thermally sensitive element and/or variation of ambient temperature. Indirectly heated NTC thermistors obtain their temperature variation by the passage of a current through a separate heater element, which is in close contact with, but electrically insulated from thermally sensitive element and/or the variation of ambient temperature.

5.22 Positive Temperature Coefficient Thermistor (PTC) — A thermistor which shows over at least a part of its resistance temperature characteristic, an important increase in its zero-power resistance with increasing temperature, the change in temperature is obtained either by the flow of current through the thermal sensitive element and/or by a variation of the ambient temperature.

5.23 Varistor — A voltage sensitive semiconductor resistor whose primary function is to exhibit a significant change in electrical resistance with a change in applied voltage.

5.24 Hygristor — A humidity sensitive semiconductor resistor whose primary function is to exhibit a significant change in electrical resistance with a change in humidity.

5.25 Voltage/Current Characteristic (for Directly Heated Thermistors) — The relation in still air at a specified temperature between the applied voltage (dc or ac 40/60 Hz) at the thermistor terminations and the current under steady state conditions, thermal equilibrium having been reached.

5.26 Voltage/Current Characteristic (for Indirectly Heated Thermistors) — The relation in still air at a specified temperature between the voltage applied at the terminations of the thermally sensitive element and the current (dc or ac 40/60 Hz) under steady state conditions, with a constant specified current through the heater element and the thermal equilibrium having been reached.

5.27 Maximum Voltage (for Thermistors) — The direct voltage which may be continuously applied to the thermistor after switching at standard ambient temperature in still air (that is for stable operation in the PTC range of the temperature resistance characteristic).

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NOTE — This index has been prepared in accordance with IS : 1275-1958*. Index numbers are clause numbers.

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